UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

OAKLAND DIVISION

EPIC GAMES, INC.,

Plaintiff, Counter-defendant,

vs.

APPLE INC.,

Defendant, Counterclaimant.

No. 4:20-CV-05640-YGR-TSH

WRITTEN DIRECT TESTIMONY OF FRANCINE LAFONTAINE, PH.D.

Trial Date: May 3, 2021
Time: 8:00 a.m.
Courtroom: 1, 4th Floor
Judge: Hon. Yvonne Gonzalez Rogers

Ex. Expert 7

I. Summary of opinions

1. As an economist and former antitrust enforcer, I offer opinions in three areas: product market definition, geographic market definition, and market power. As explained below, my overall conclusion is that Apple does not possess monopoly power or charge supracompetitive prices in the relevant market for digital game transactions in the United States.

Product market definition

2. **Opinion 1.** The App Store is a two-sided transactions platform (as Dr. Evans acknowledges). As a result, market definition must be evaluated from the perspective of both consumers and developers, and the product is transactions, i.e., the analysis must evaluate where content is paid for, not where it is used (which can be different) (§ III.A, p. 5).

3. **Opinion 2.** Epic's experts have failed to perform the analysis that would permit a finding that all iOS apps—many of which are not substitutes for one another, such as game apps and other types of apps—may be clustered together in the same antitrust market. Distinct product markets can only be clustered for purposes of market definition if competitive conditions are similar for all product markets that are grouped into the cluster market (§ III.B.ii, pp. 7–8). Since games face different competitive alternatives from other types of apps, it follows that grouping all types of apps together, as Epic proposes to do, would be inappropriate as a cluster market (§ III.B.iii, p. 8).

4. **Opinion 3.** Game transactions on digital transaction platforms constitute a relevant product market that is distinct from other types of app transactions, and inconsistent with Epic's attempts to define a single market that includes all types of apps (§ III.B.i, pp. 5–7). Game developers and consumers substitute between transaction platforms when seeking out game transactions, supporting a conclusion that the relevant market is the market for game transactions across digital transaction platforms, rather than an iOS-only market for all app transactions (§ III.C.i, pp. 9–10). The evidence also refutes Epic's experts' assertion that platforms are complements rather than substitutes (§ III.C.ii, p. 10).

5. **Opinion 4.** Dr. Evans proposes a foremarket/aftermarket framework to support a single-brand market definition. But substitution between transaction platforms means that developers and consumers are able to switch in the alleged aftermarket without having to also switch in the alleged foremarket, critically distinguishing the present case from historical applications of the foremarket/aftermarket framework (§ III.C.iii, pp. 10–11).

6. **Opinion 5.** Even if the foremarket/aftermarket framework were to be applied, anticompetitive concerns are absent here, because neither consumers nor developers face a lack of competition in a more appropriately defined foremarket; they do not lack information about aftermarket terms; and they have not been subjected to unexpected adverse changes in aftermarket terms (§ III.C.iv, pp. 11–12).

7. **Opinion 6.** Because game developers have many ways to transact with consumers, the dispute here is not about access, but rather about the terms of access (§ III.C.v, p. 12).

8. **Opinion 7.** Dr. Evans' hypothetical monopolist "tests" are fundamentally flawed and do not establish relevant antitrust product markets. While they may appear to bring a sense of scientific rigor to the market definition exercise, none of these "tests" contain valid, formal analyses of consumers' or developers' substitution patterns in the face of a real-world change in price or quality. The "tests" are without probative value (§ III.D, pp. 13–19).

Geographic market definition

9. **Opinion 8.** Geographic restrictions and differences in market conditions mean that even though the product is digital, geographic markets should be defined on a country-by-country basis. The appropriate geographic market here is the United States (§ IV, p. 20).

Market power

10. **Opinion 9.** Output, properly measured and benchmarked, is the metric that generally best captures the relevant net effects when evaluating the existence or extent of market power (§ V.A, pp. 21–22).

11. **Opinion 10.** Output on the App Store has grown at a rate substantially faster than the overall market between 2010 and 2018. This indicates that Apple does not restrict output on the App Store as a monopolist would, and that it offers a *lower* quality-adjusted price than many of its competitors. Moreover, Apple has not increased commission rates since introducing the App Store in 2008, when Dr. Evans acknowledges it had no market power; Apple does not have a large share of the properly defined relevant market; and the market has experienced entry and expansion by multiple competitors (§ V.B, p. 22).

12. **Opinion 11.** Dr. Evans relies on five "indicators" to argue that Apple has monopoly power, but they are all flawed and cannot support such a conclusion (§ V.C, pp. 23–24).

13. **Opinion 12.** In addition to Dr. Evans' faulty comparison to China, his "analysis" of a but-for world involving app store entry suffers from fatal methodological and conceptual flaws, as evidenced by several results that do not comport with intuition, standard economic outcomes, or reality. That analysis should be disregarded (§ V.D, pp. 24–25).

II. Background and Qualifications

14. I am the Associate Dean for Business + Impact, and the William Davidson Professor of Business Economics and Public Policy, at the Ross School of Business at the University of Michigan. I am also Professor of Economics (courtesy) at the University of Michigan's Department of Economics.

15. My academic research is in the field of economics called Industrial Organization. Within Industrial Organization, my research focuses on several related topics: vertical relationships, franchising, and entrepreneurship, and associated policy issues.

16. From Fall 2014 to the end of 2015, I served as Director of the FTC's Bureau of Economics. In that position, I oversaw the economic analyses for all regulatory and enforcement matters that bureau staff were involved with, including those involving mergers, monopolization, franchising, and vertical relationships. These matters included five merger cases that focused heavily on market definition: three hospital mergers, *Sysco/US Foods*, and *Staples/Office Depot*.

17. I have published many papers in peer-reviewed academic journals that address economic questions related to franchising and vertical contracts; coauthored a book titled *The Economics of Franchising*; am currently a co-editor of the *Journal of Economic and Management Strategy*; have previously co-edited the *Journal of Law, Economics, and Organization*; and served in other editorial roles and as a reviewer at several other peer-reviewed academic journals.

III. The relevant antitrust product market is the market for game transactions on digital transaction platforms

18. The relevant antitrust product market in this case is the market for game transactions on digital transaction platforms, including downloads, updates, and in-app purchases. Dr. Evans disagrees, proposing instead three markets that collectively focus on all apps without regard to subject matter, but limited to iOS rather than all digital transaction platforms where game transactions are offered.

A. The App Store is a two-sided transaction platform and so the relevant product is transactions

19. Professor Schmalensee and I have explained, and Dr. Evans acknowledges, that the App Store is a two-sided transaction platform. Historically, video games were sold on physical media, such as discs and cartridges. In the past two decades, video games have been increasingly sold digitally, meaning as downloads over the internet. The App Store facilitates download, upload, and in-app purchase transactions between developers and consumers. The product, in other words, is transactions. Dr. Evans is wrong to focus market definition on "distribution," disregarding the transactional nature of the relevant market.

20. Market definition is fundamentally about demand substitution—whether customers are willing and able to substitute if terms of trade worsen, including if quality decreases or price increases. Therefore, the "perspective" by which to evaluate any proposed market definition is the perspective of the customers of the products. Defining markets in the context of two-sided transaction platforms requires that customers on both sides of the platform be taken into account. The inquiry must therefore consider the competitive alternatives available to developers and consumers for *transactions*—where app content is paid for, not where it is used. Consumers and developers can substitute to platforms other than the App Store for transactions even if they continue to play a particular game on the iPhone.

21. Because the relevant product is transactions, much of the evidence that Dr. Evans presents is irrelevant to market definition, as it focuses on the availability of specific games on different devices, not on whether developers and consumers can transact across platforms. Even the rare consumer who has access to only an iOS device has a readily available game transaction alternative to the App Store—the Safari browser. For example, any *Fortnite* player can use Safari (or Chrome) to purchase *Fortnite*'s in-game currency, "V-Bucks," a transaction that generates no commission for Apple.

B. Epic's market definition improperly clusters game transactions with other types of app transactions that face different competitive conditions

22. The role of market definition is to provide a conceptual framework to guide and discipline antitrust analysis. It is not an end in and of itself, but rather one of several tools to evaluate the theories of harm at issue. Markets that are too broadly defined may fail in that role by overstating the competitive alternatives available to customers facing the exercise of market power, while markets that are too narrowly defined may understate such alternatives.

23. Market definition focuses on customer substitution.[1] In this case it must therefore focus on the set of options available to consumers and developers for their transactions. Dr. Evans thus fundamentally misses the relevant economic issue when he states that Apple's policies "apply to all apps."[2] Even setting aside their erroneous focus on game distribution as opposed to game transactions, Epic's experts have failed to establish that all iOS apps are reasonable substitutes for one another.

24. As one example that I explain further below, game transactions—the type of transactions that Epic primarily engages in—are distinct from other types of digital transactions. Consumers who play games and are facing higher prices or lower quality are unlikely to substitute to a non-game app or non-game transactions. Similarly, game developers typically focus on game apps, and are therefore also unlikely to respond to higher prices or lower quality by shifting efforts to develop types of apps other than games, or to substitute to non-game transactions. Moreover, game developers and consumers who play games have a distinct set of competitive alternatives compared to developers and consumers of other types of apps.

25. To address the specific theory of harm in this case, market definition cannot ignore the competitive alternatives available to Epic and similarly situated developers (i.e., game developers), as well as the consumers who transact with them. I show below that this is a distinct and identifiable product. Indeed, Dr. Evans acknowledges that *Fortnite* has more "substitution possibilities" than other types of apps do.[3]

i. Qualitative and quantitative evidence supports game transactions on digital transaction platforms as a distinct relevant product market

26. Professor Hitt provides qualitative evidence that game transactions are economically distinct from transactions for other types of apps. The economic analysis is informed by commercial realities, including that industry players treat games differently from other types of apps. Game app developers often use specialized technology to create game apps. Game transactions are offered via both general storefronts (which present games as a specific category) and specialist storefronts (that only or predominantly offer games). For example, many of the transaction platforms' user interfaces, including those of the App Store, Google Play, and the Amazon Appstore, reflect the distinction between game transactions and non-game transactions, often categorizing "games" into a separate tab of apps. This implies that platforms recognize that consumers sometimes visit the platform looking for games and benefit from having games collected in one location. This is similar to how Walmart separates wine and tools into separate sections of its store. Apple's internal business strategies provide further qualitative evidence that games are distinct from other app transactions: on the App Store, editors consider special factors when curating games, and Apple has two separate heads of business development, one for games and one for all other apps.

[1] U.S. Department of Justice and the Federal Trade Commission, "Horizontal Merger Guidelines," August 19, 2010, p. 7.
[2] Written Direct Testimony of Dr. David S. Evans, ("Evans written testimony"), ¶ 39.
[3] Evans written testimony ¶ 125.

27. Professor Hitt also provides quantitative evidence that game developers tend not to diversify their offerings beyond game apps (consistent with a lack of substitution on the part of game developers to transactions for other types of apps), and that they interact with various platforms, including those that offer mostly or only game transactions, to transact with consumers who play games. This further supports a finding that game transactions are a distinct product market.

ii. Where competitive conditions for products are not similar to competitive conditions for other products, it is inappropriate from an economics perspective to cluster them into a single antitrust market

28. One aspect of my assignment was to address questions posed by the Court in its October 9, 2020 preliminary injunction order, including whether "clustering" warrants expanding the relevant product market beyond games. Dr. Evans stated in his deposition that he is not taking the position that "iOS app distribution" is a cluster market, yet he also does not offer an opinion on whether transactions for other types of apps could be substitutes for game transactions. If two products are not substitutes for one another, they belong to distinct product markets and there is no economic basis to group them into a single antitrust market, unless that market is a cluster market. If all of the transactions in Dr. Evans' market definition can be assembled into a single market, without invoking a cluster market, then it must be that when game developers or consumers who play games are faced with higher prices or lower quality they would substitute to transactions for other types of apps on iOS, instead of substituting to game transactions on other platforms.

29. Cluster markets refer to combinations of individual product markets where products are bought and sold independently. Though the products in a cluster market are not reasonably interchangeable and so are not substitutes, economists and courts sometimes group them together for analytical convenience. Clustering products that are not substitutes only makes sense as an economic matter if the products are subject to similar competitive conditions and, effectively, the answers one would get from analyzing any one underlying product market would be the same as those obtained in analyzing another underlying product market, or the cluster market itself.

30. For example, consider hospital services. Cardiology and trauma services are not substitutes, nor are they bought as a bundle. Yet they could be grouped together in a single cluster market for analytical convenience if the competitive conditions that are faced by patients are similar for both sets of services. It would *not* be appropriate to group them together if all hospitals offer cardiology services, yet only some hospitals offer trauma services. Clustering these together under such conditions would likely lead to understating competition for cardiology services or overstating competition for trauma services.

31. The 2016 *Staples/Office Depot* case, the economics of which I oversaw in my role at the FTC, helps clarify when clustering is and is not appropriate. In that case, the FTC successfully argued that it was appropriate to cluster consumable office supplies (e.g., pens, file folders, Post-it notes, binder clips, paper for copied and printers) in a single antitrust market because these products faced similar competitive conditions, even though they are not functional substitutes for each other. Put another way, pens and paper clips are not reasonable substitutes and hence do not belong in the same product market, but distinguishing between those separate product markets would have made no difference in understanding competition in the office supplies industry.

However, ink and toner were excluded from the cluster market, because there was evidence of additional competition in the product market for ink and toner. A cluster market that included ink and toner thus would lead to either understating competition for ink and toner or overstating competition for other consumable office supplies.

32. Another example from my time at the FTC relates to pharmaceutical mergers. Consistent with market definition being about demand substitution, the FTC defines separate markets around specific molecules in analyzing such mergers, they do not define a single market encompassing all the molecules that the firms produce. Pharmaceutical companies may well apply similar policies (sales terms, quality control, etc.) to all of their products, but this is not a reason to cluster all molecules into a single market. Instead, customers typically face different competitive alternatives for each molecule, leading to separate relevant antitrust markets. A merger might then raise concerns in some but not all relevant antitrust markets.

iii. Competitive conditions faced by game developers and consumers who play games differ from competitive conditions faced by developers and users of other types of apps, and so clustering all apps together would be inappropriate as an economic matter

33. In the present matter, clustering all app transactions would be appropriate if and only if all the different types of apps in the App Store—such as gaming apps, dating apps, wellness apps, etc.—faced similar competitive conditions regarding transactions. Epic's experts have not analyzed this question or offered any support for clustering all apps, without regard to subject matter, in a single market.

34. Professor Hitt has provided extensive evidence that many other types of apps do not face similar competitive conditions with game apps. (Indeed, other types of apps also face different competitive conditions from one another.) There exist many transaction platforms that focus on games (e.g., PlayStation, Xbox, Steam) and that are meaningful substitutes for game developers and consumers who play games, but not for developers and consumers of other types of apps. There are also important monetization differences (such as the share of games relative to other types of apps that use subscriptions) that lead to important differences in market outcomes, such as average commission rate. Other types of apps could have competitive alternatives that are not available to game apps. For example, consumers can use an internet-connected smartwatch to replicate the functionality of calculator or weather apps that they would otherwise use on their phone. They can also replicate the functionality of music or health & fitness apps through fitness watches and associated transaction platforms. As a result, it is inappropriate to cluster all apps on the App Store together, and the appropriate economic analysis in the present case must focus on game app transactions.

35. In contexts where multiple product markets may be defined, one should choose among them remembering that relevant antitrust markets must be defined with the specific theory of anticompetitive harm in mind. Consider again the market definition in *Staples/Office Depot*. Instead of a merger challenge by the government, which should consider harm to any consumer, consider a hypothetical private litigation involving a specific business that purchases only ink and toner from Staples. In such a case, it is irrelevant that one could appropriately define a cluster market for consumable office products excluding ink and toner. The case instead should be analyzed using a product market focused on ink and toner. Similarly, the present matter

should be analyzed using a product market focused on game transactions regardless of other transaction markets in which Apple may compete.

C. Epic's market definition improperly dismisses competition from other transaction platforms by focusing on iOS alone

36. Another area of disagreement with Epic and Dr. Evans concerns their exclusion of other transaction platforms from their product market definition. While substantial evidence, discussed below, shows that consumers who play games and game developers multi-home and substitute between transaction platforms, Epic and Dr. Evans insist on a market focused only on iOS apps. They arrive at this conclusion by making two conceptual errors. First, they erroneously consider different transaction platforms to be complements instead of substitutes. Second, they analyze this case through the lens of foremarkets and aftermarkets, which is fundamentally ill-suited to the present context.

i. Qualitative and quantitative evidence indicates substitution between transaction platforms, supporting game transactions across transaction platforms as the relevant product market

37. Similar to Dr. Evans, neither Professor Hitt nor I offer a quantitative hypothetical monopolist test ("HMT") in this matter. Nonetheless, in his direct testimony, Dr. Evans notes that "the HMT can sometimes be conducted qualitatively by asking whether a SSNIP is likely to be profitable given the evidence presented."[4] I now discuss evidence that supports game transactions across digital transaction platforms as the relevant product market.

38. Professor Hitt provides qualitative evidence of substitution across transaction platforms. For example, [redacted].

39. Professor Hitt also provides quantitative evidence that confirms substitution across game transaction platforms by developers and consumers. First, he presents evidence of extensive *multi-homing*. Game developers "multi-home" by offering and monetizing their apps across multiple game transaction platforms. Consumers generally multi-home by owning or having access to multiple devices on which different game transaction platforms are available, playing across multiple devices, and purchasing items and game functionality that they can use across multiple devices. Multi-homing on its own is not evidence of switching, but the qualitative evidence on substitution makes it clear that multi-homing facilitates switching. Taken together, the qualitative evidence and evidence on substitution indicate an ability and willingness by game developers and consumers to substitute across platforms.

40. Second, Professor Hitt provides direct empirical evidence that consumers substitute across the platforms on which they multi-home. For example, he shows substitution in the transactions of iOS *Fortnite* users before and after the Epic "hotfix," as well as substitution of transactions by iOS users around the time they purchased a game console (analyzing data at the introduction of

[4] Evans written testimony, ¶ 35.

the Nintendo Switch and, separately, when consumers downloaded an app that is meant to be used alongside a given console). Additionally, Professor Hitt provides evidence that 65.6% of the consumers who play *Fortnite* on iOS and have made in-app purchases have done so exclusively on other platforms. [redacted]

41. Dr. Evans fails to address the qualitative and quantitative evidence of substitution across platforms that Professor Hitt has presented.

ii. Epic's experts are wrong to argue that transaction platforms are complements rather than substitutes

42. Economists have a specific definition of complements and substitutes; two goods are complements if an increase in the price of one decreases demand for the other, and the opposite is true for substitutes. Together, this definition, basic logic, and the qualitative and quantitative evidence on substitution above demonstrate that transactions across platforms are substitutes, not complements. All else equal, increasing the price of in-app purchases on the App Store would not lead to decreased in-app purchases on consoles—it would lead to the opposite result.

iii. Multi-homing is a critical distinction between the present case and historical applications of the foremarket/aftermarket framework

43. Economists generally do not consider single-brands to constitute their own antitrust markets. Product differentiation is the norm in most markets, so not having perfect substitutes does not mean that a product faces no competition. Arguing for a single-brand market requires more than just pointing out that the App Store and iOS devices are differentiated.

44. One way to argue for a single-brand market, which Epic and its experts rely on, is to use a foremarket/aftermarket framework. Indeed, relying on this framework is how Epic and its experts arrive at their market for "iOS app distribution." As I discuss here, this case is fundamentally different from past contexts in which this framework has been invoked.

45. By way of background, economists define "aftermarket transactions" as those in which the aftermarket product or service is used together with a "primary" or "foremarket" product or service, and the aftermarket product or service is purchased after the primary product or service. Typically, foremarket products constitute durable, long-term investments, and aftermarket products are brand-specific consumables or maintenance services (e.g., Nespresso pods for Nespresso machines or HP-branded ink for HP inkjet printers). The issue that is highlighted in such markets is that the only way for a consumer to switch to a different provider in the aftermarket is also to switch in the foremarket. This of course can be an expensive proposition as it would involve reinvesting in a new durable product.

46. This concern does not apply to the present matter because there is no need to make a new durable investment in any foremarket to switch across game transaction platforms. We have already seen that consumers and developers multi-home, which allows them to substitute transactions across platforms without requiring substitution in any foremarket.

47. In other words, the foremarket/aftermarket framework fundamentally depends on lock-in effects in the foremarket, which are absent here. This is because consumers multi-home across devices, and so the App Store can lose a consumer's game transactions even if the consumer does not replace their iPhone. As I have discussed, even consumers who do not own or have access to a device other than an iOS device can use the Safari browser to transact through the developer's website.

48. Meanwhile, developers are not locked in, either. Nothing in Apple's license restricts developers from offering transactions on other platforms, or "steering" consumers to other platforms by charging less on these platforms or more on the App Store. Dr. Evans describes only what he terms a "nominal" $99 yearly developer fee as the required foremarket payment to Apple from those customers.

49. Because neither developers nor consumers are "locked in" to their iOS devices, this case does not fit with historical applications of the foremarket/aftermarket framework, and so the framework should not be applied to this case.

iv. Aftermarkets give rise to anticompetitive concerns only under particular circumstances that substantially differ from the circumstances here

50. The economic literature and antitrust agencies explain that when the framework is relevant, aftermarket concerns nonetheless *only* arise when (1) there is no robust competition in the foremarket, (2) customers cannot gather sufficient information about aftermarket terms and costs before buying in the foremarket, and (3) locked-in customers are surprised by unexpected changes in aftermarket terms.[5] As I discuss below, none of these conditions are met for consumers or developers, and so even if one were to define a foremarket and aftermarket, there would be no anticompetitive harm.

51. Starting with consumers who play games, note that:

- (1) While Dr. Evans defines the foremarket as operating systems, consumers do not purchase operating systems; they purchase smartphones, which would be the product that consumers buy in a foremarket if one were to be defined in this case. I discuss below several reasons why Dr. Evans' support for a smartphone operating systems market is insufficient. Apple faces strong competition in the smartphone market, competing with dozens of smartphones designed and marketed by multiple well-funded smartphone manufacturers. If the iPhone were not a competitive offering, then its customer base would quickly evaporate.
- (2) Prior to purchasing a smartphone, consumers have sufficient information available to them about differences in smartphone options, as well as aftermarket terms including terms related to apps. This information is available in product reviews and publications, or would be if considered important and different across platforms.
- (3) Consumers are not locked in. Many consumers upgrade their devices and some switch to an Android device. If consumers were locked in, one might expect them to indicate

[5] United States Federal Trade Commission, "Competition Issues in Aftermarkets," Organisation for Economic Co-operation and Development Competition Committee, June 2017.

regret or lack of satisfaction, but data on satisfaction and demand from new smartphone users show that those who do not switch are happy with their iPhones. Furthermore, Apple has not made unexpected changes to its terms or prices offered to developers, maintaining or improving its policies from the outset. Nor has Apple changed its terms or prices offered to consumers, who are not charged by Apple for their use of the App Store.

52. Turning to developers:

- (1) Competition in Dr. Evans' foremarket cannot be evaluated because game developers do not buy operating systems. An operating system without a mechanism that facilitates app transactions is not a two-sided platform because developers have no way of interacting with consumers on, and have no use for, a closed operating system. Even if there were a developer foremarket for smartphone operating systems, Apple's and Google's low prices and frequent updates and innovations suggest no lack of competition in Dr. Evans' foremarket.
- (2) Terms for developers have also been clear in their contracts and have not adversely changed. For example, Apple's Developer Program License Agreement makes clear that developers set their own prices but must pay a commission up to 30 percent of the prices they set.[6]
- (3) Apple has offered developers the same—and in some cases, better—terms since introducing the App Store in 2008, a point in time when it held a very small share of phone or smartphone sales, and, by definition as an entrant, held no share in game transactions (and when Dr. Evans acknowledges Apple had no monopoly power).

v. Multi-homing and substitution by consumers and developers demonstrates that the dispute here is about the terms of access, not about access itself

53. Dr. Evans describes the App Store as the only way for a developer to "gain access to 1 billion iPhone users globally."[7] He extends this argument with an analogy, arguing that a manufacturer must sell in both California and Oregon if it wishes to reach customers in both states.

54. This argument is incorrect. The multi-homing and substitution evidence discussed above shows that game developers typically have multiple ways to transact with consumers who play games and Dr. Evans is wrong to argue that the App Store is the only way to transact with owners of iOS devices. As noted earlier, even consumers who only have access to an iOS device can use a browser to directly transact with game developers. But as explained by Professor Hanssens, most iPhone users have access to other devices. This means that the dispute here is ultimately about the terms of access, including the commission rate, not about access itself. It also means that Dr. Evans' analogy does not work. Few customers (literally) multi-home by living and shopping in both California and Oregon, whereas most game developers and consumers have the opportunity to multi-home.

[6] DX-3256.
[7] Evans written testimony, ¶ 295.

D. Dr. Evans' hypothetical monopolist tests are fundamentally flawed and do not establish relevant antitrust product markets

55. The hypothetical monopolist test is the thought experiment by which economists conceptualize the market definition exercise of whether markets are drawn too narrowly.

56. At the center of Dr. Evans' market definition analysis are six purported hypothetical monopolist tests in support of his alleged "smartphone operating systems" and "iOS App Distribution" markets. (Dr. Evans conducts a seventh hypothetical monopolist test for his alleged "In-App Purchase Payment Processing" market. Prof. Schmalensee addresses this test.) Dr. Evans offers three "tests" for each of his two alleged markets—one for the consumer side, one for the developer side, and finally one that purports to test both sides at once, since he recognizes them as two-sided transaction platforms (and his own writings indicate the two sides should be tested together in these types of markets). All six "tests" are deeply problematic and misleading, and should be disregarded.

57. First, Dr. Evans overemphasizes the importance of these "tests" in his market definition analysis. Antitrust agencies and economists typically do not define relevant antitrust markets mechanically under the hypothetical monopolist test. Rather, as Dr. Evans ultimately agreed in his deposition, antitrust agencies and economists tend to define markets based on both quantitative and qualitative evidence (e.g., documents and testimony identifying competitors or describing competitive pressures). This typically leads to markets that constitute intuitive, natural groupings of products that conform to market realities. Thus, Dr. Evans is wrong to state in his report that the hypothetical monopolist test "involves finding the *narrowest* set of products that would enable a hypothetical monopolist to raise price profitably by a small but significant amount"[8] (emphasis added), an argument he walked back from in his deposition.

58. A mechanical application of the hypothetical monopolist test to find the narrowest market can lead to outcomes that would make market definition unhelpful to evaluating antitrust claims. For example, the narrowest product market in which Coca-Cola competes may be a narrow market that consists solely of Coca-Cola and Pepsi-Cola, the two most popular sodas. Such a market would be unhelpful in evaluating a proposed merger between Coca Cola and Dr. Pepper, or hypothetical collusion between PepsiCo and Dr. Pepper. Note that, when the FTC challenged the proposed merger of Coca Cola and Dr. Pepper in 1986, it defined a market of all carbonated soft drinks rather than a narrower market of some collection of soft drinks that satisfied the hypothetical monopolist test.

59. In addition, while Dr. Evans' "tests" may appear to bring a sense of scientific rigor to the market definition exercise, they are fundamentally flawed and uninformative in establishing whether either of his markets are relevant antitrust product markets. At the most basic level, and addressed more fully below, none of these "tests" contain valid, formal analyses of consumers' or developers' substitution patterns in the face of a real-world change in price or quality. Dr. Evans admitted in his deposition that his "tests" do not rely on evidence of actual switching. Nor did he consider the Apple transactions data in evaluating substitution. Customers' substitution patterns in response to price or quality changes are central to the market definition exercise, and

[8] Evans initial report, ¶ 236.

any hypothetical monopolist test that fails to identify these patterns cannot have probative value. In most cases, as discussed below, Dr. Evans merely postulates a price change and asserts, without support, that few customers would substitute in response.

60. Note that Dr. Evans does not profess to apply a hypothetical monopolist test for game transactions, and so he has not shown that a hypothetical monopolist test would invalidate game transactions across digital transaction platforms as too narrow.

i. Dr. Evans' consumer-side "test" for his alleged "smartphone operating systems" market

61. Most of the problems with Dr. Evans' first "test" follow from the fact that consumers do not buy smartphone operating systems, a fact that Dr. Evans acknowledges. He nonetheless proceeds to "test" the consumer side of this alleged market, which he claims is a two-sided transaction platform. In his direct testimony, he argues that defining his foremarket around OSs rather than devices is appropriate because the OSs "have differentiated accompanying ecosystems, and…consumers first and foremost choose the ecosystem experience they want."[9] This is not sufficient grounds for defining his market. First, he offers no analysis of device choice to show whether consumers do, in fact, "first and foremost choose the ecosystem." Second, even if the ecosystem were an important factor in device choice, this does not mean that it is the only factor and that the market should be defined around ecosystems. Even ignoring both of these issues, this approach would suggest a market for "ecosystems," which are related to but not the same as smartphone operating systems. For example, iOS users can participate in the Google ecosystem through the (free) Gmail, Google Photos, and other apps and services, without ever purchasing an Android device.

62. To underscore how artificial his alleged market is, in devising the "test," Dr. Evans does not consider consumer substitution to other operating systems (his alleged product), but rather to "*other devices*"; indeed, Dr. Evans admits this in his direct testimony, when he says that he looks at "whether smartphones, personal computers, and game consoles—and their respective OSs—sufficiently substitute for one another to comprise a single relevant market."[10] Furthermore, while Dr. Evans presents his SSNIP as an increase to the price of smartphone operating systems, he is forced to apply the price change to the smartphone overall.

63. The first problem with "testing" a market for a product that consumers do not actually buy is finding the product's price. Dr. Evans admits that "Apple and Google do not charge explicit prices for their OSs."[11] Dr. Evans is forced to resort to critically flawed comparables—specifically prices for Windows and the (defunct) Windows Phone operating system. For Windows, Dr. Evans bases his SSNIP on the prices that Microsoft charged *manufacturers* for its operating system, even though his "test" is purportedly focused on *consumers*, and even though Microsoft sells Windows to consumers at retail, charging $139 for a basic "Home" version, $200 for a "Pro" version, and $309 for a "Pro for Workstations" version. These prices are all substantially higher than the prices charged to manufacturers that Dr. Evans relies upon. Thus,

[9] Evans written testimony, ¶ 41.
[10] Evans written testimony, ¶ 17.
[11] Evans written testimony, ¶ 67.

even setting aside the other flaws with his "test," Dr. Evans substantially understates the consumer price of operating systems and thus also understates the size of the SSNIP.

64. Even if one were to base the SSNIP on manufacturer prices, Dr. Evans uses the price charged for a failed smartphone operating system (Windows Phone) and an operating system for PCs (Windows). Neither is a good comparable, and both are from roughly a decade ago (2012 and 2009, respectively).

65. Android would provide a more current comparable, but it is still an operating system that is offered to smartphone manufacturers, not consumers. Moreover, as Dr. Evans acknowledges, Android is offered to manufacturers at a price of $0. While this $0 price does not reflect Android's true value—iOS and Android clearly both have substantial value—this $0 price would imply a $0 SSNIP, which highlights that "smartphone operating systems" is not a well-defined market.

66. Had Dr. Evans focused his foremarket on a product that consumers actually purchase, the smartphone, the SSNIP would have been based on substantially higher prices. Dr. Evans presents a $551 average price for U.S. smartphones but also acknowledges that "Apple specializes in selling premium smartphones that appeal to consumers who are more likely to use and spend on smartphone apps."[12] For example, the price of Apple's current generation iPhone 12 ranges from $699 for the baseline iPhone 12 Mini to $1,399 for an iPhone 12 Pro Max with 512 GB of memory. A 10% SSNIP on a $1,000 phone would be $100, not the $3–$5 that Dr. Evans uses.

67. Having postulated the price and level of SSNIP, Dr. Evans then simply asserts, with no formal analysis and no data on the substitution relevant to his purported market, that it would be "implausible" that a hypothetical monopolist could not profitably raise price by $3 or $5.

ii. Dr. Evans' developer-side "test" for his alleged "smartphone operating systems" market

68. Dr. Evans makes a similar error in "testing" a market for a product that developers also do not actually purchase. Dr. Evans' alleged foremarket (smartphone operating systems) is not actually a two-sided transaction platform without his alleged aftermarket (i.e., without the App Store or other means to transact with consumers on iOS). Smartphone operating systems only have value to developers insofar as they present an opportunity to transact with consumers. Therefore a hypothetical monopolist test that focuses on developers, yet is divorced from transactions, is ill-conceived.

69. As with his previous "test," this causes problems with finding an appropriate price. Dr. Evans bases his SSNIP on a $99 price, which he acknowledges is "nominal," remarking that the resulting SSNIP would be "negligible" and "could not have any plausible impact" on developers (again without performing any formal analysis based on actual substitution in his alleged market, because there is no such market). This is inconsistent with Dr. Evans' characterization of Apple and Google holding a "duopoly" of smartphone operating systems with few competitive constraints, and would imply that the "duopolists" are leaving money on the table. Of course, the price that developers actually care about is the commission associated with "iOS App

[12] Evans written testimony, ¶ 81.

Distribution." Yet Dr. Evans ignores commissions within this "test," because he attributes them to a separate market—"iOS App Distribution."

70. Dr. Evans refers to a sensitivity analysis where he does calculate "prices" to include commissions. But he does so in a nonsensical way, by spreading commissions across all developers and all smartphones. No developer pays a commission on a "per smartphone per year" basis or views this "price" as a salient feature of its interaction with the App Store.

71. The above demonstrates another critical flaw in Dr. Evans' "test"—it treats all developers (in his alleged "all apps" market) as if they are the same. However, as Professor Hitt explains, developers pursue many different monetization strategies, and an increasing number of them pay no commission, monetizing instead through ads, on other platforms, through traditional retail channels, or offering free apps altogether. Thus, any analysis appropriately reflecting that commissions are the prices relevant to developers would analyze a substantially larger SSNIP on a subset of developers that pay substantial commissions. This likely includes Epic and many other game developers that are participants in the relevant antitrust market for game transactions, since as Professor Hitt shows, game apps are more likely to monetize through the App Store, more likely to use in-app purchases, and face high average commissions on the in-app purchases they offer.

iii. Dr. Evans' consumer-side "test" for his alleged "iOS App Distribution" market, which relies on inputs from Professor Rossi's flawed survey

72. Conceptually, Dr. Evans' "test" highlights the reasons economists generally do not recognize single-brand markets. To demonstrate that a SSNIP would be profitable in a single-brand candidate market is necessarily to argue that a firm is not currently maximizing its profits, an argument that deviates from a key assumption underlying microeconomics in general and industrial organization economics in particular. Dr. Evans reaches precisely this erroneous conclusion in the present case, finding that Apple has "left some money on the table" to the tune of nearly *a billion dollars* in 2019 alone. Dr. Evans provides no explanation as to *why* Apple has not raised its commission given his prediction that doing so would be profitable. What is more likely is that Dr. Evans' conclusion is incorrect—that Apple in fact is constrained by existing competition and potential entry in transactions so it cannot profitably raise its commission rate.

73. Additionally, this "test" again treats all developers as if they are the same. In this case, he assumes a specific behavior by all developers, namely that they will "pass through" 50% of any increase in commissions to final consumers in the form of higher app prices. One should not expect that developers across all types of apps and in-app purchases available on the App Store would pass through increased commissions at the same rate.

74. Furthermore, this "test" relies extensively upon fundamentally flawed survey data inputs from Professor Rossi. In particular, Dr. Evans relies on Professor Rossi for purported substitution data, namely on the extent to which consumers will supposedly reduce their purchases on the App Store or switch away from their iPhones entirely. This survey data is the only data on substitution in response to a price change that Dr. Evans uses across any of his "tests," but it is entirely unreliable for the purpose to which Dr. Evans puts it. I leave the critique of the design and implementation of the survey to Professor Hanssens. Here I discuss, from an economic

perspective, three main shortcomings of the survey data as the basis for Dr. Evans' hypothetical monopolist "test."

75. First, Professor Rossi's survey (and therefore Dr. Evans' entire "test") focused on the wrong product. As Dr. Evans confirmed in his direct testimony, this "test" is purportedly about "iOS App Distribution," which Dr. Evans defined in his deposition as only downloads (installs and updates). Yet Professor Rossi's survey is entirely about in-app purchases, as Dr. Evans acknowledged in his direct testimony. In other words, the survey cannot speak to substitution relevant to Dr. Evans' alleged "iOS App Distribution" market because it ignores app downloads and updates.

76. Second, Professor Rossi's survey focused on the wrong price change. A hypothetical monopolist test should consider a *non-transitory* price change, but in Professor Rossi's survey, respondents were explicitly asked about prices in the last 30 days. This is a critical error because consumers' responses to longer-run price changes can be substantially different from their responses to shorter-run price changes. This makes the survey responses unusable for any hypothetical monopolist test.

77. Third, Professor Rossi's survey failed to present to participants important choices that would be available to consumers. For example, Professor Rossi did not account for the fact that, according to Dr. Evans, consumers consider buying a new smartphone only every two to three years.[13] Thus, even if most participants in Professor Rossi's survey would not have considered switching platforms during the particular month of the survey, they might have considered this option later, when they were due to upgrade their phones. This omission leads the survey to underestimate the degree of switching in the long run, making it more likely that the alleged market "passes" the test when it should not. (In early participant interviews, before he ran the actual survey, Professor Rossi asked participants to assume that it was time to purchase a new phone.) As Professor Hanssens explains further, Professor Rossi also did not clearly and transparently offer consumers what might be the most attractive response to the price increase—consuming the same apps and premium in-app content on iOS, but paying for them on another platform.

78. Fourth, Professor Rossi's survey focuses on respondents in the United States only, and he testified in his deposition that he would hesitate to extrapolate to other countries, but Dr. Evans purports to conduct a hypothetical monopolist test for a global market.

79. Finally, setting aside the bias Professor Rossi has likely introduced, it is useful to put Dr. Evans' estimate of device switchers into context. Dr. Evans claims that "98.6% of spending-weighted respondents would not respond by switching to an Android device."[14] In context, however, Professor Rossi's estimates imply that a five percent increase in in-app purchase prices on the App Store would cause the number of iPhone owners purchasing new Android phones to more than *triple* over the usual rate. In other words, even with all its errors, Professor Rossi's survey finds a sizeable effect on consumers' willingness to switch away from iPhones in the

[13] Evans initial report, ¶ 368.
[14] Evans written testimony, ¶ 137.

event of an in-app purchase price increase, which is inconsistent with the notion that Apple can profitably raise its commission rates.

iv. Dr. Evans' developer-side "test" for his alleged "iOS App Distribution" market

80. This "test" also highlights the problem with purported single-brand markets, with Dr. Evans again concluding that Apple is an *actual* monopolist but that it has failed to choose the profit-maximizing price. Again, it is far more likely that Apple is constrained by existing competition or potential entry in the market for transactions than that it has foregone a profitable price increase for no particular reason. Dr. Evans does not offer any evidence to the contrary.

81. Also as before, this "test" considers the wrong product, with Dr. Evans again focusing entirely on in-app purchases rather than initial downloads (presumably because *Fortnite*, the case study on which the "test" is based, is free to download and so pays nothing for "iOS App Distribution"). However, despite the focus on in-app purchases, this "test" purportedly is for his alleged "iOS App Distribution" market rather than his "In-App Purchase Payment Processing" market.

82. Much as Professor Rossi ignored important options available to consumers, Dr. Evans considers only one potential developer response to a commission increase—exiting iOS altogether. But developers could avail themselves of several other potential and less disruptive responses should the App Store increase commission rates. These include passing through the App Store commissions to consumers who buy through iOS (e.g. increasing the price they pay by the level of the commission), thus also steering consumers to websites and other platforms (i.e., more strategically utilizing the multiplatform approach); changing the monetization strategy, such as moving toward advertisements or subscriptions; or moving to a web app. Dr. Evans has not conducted any analysis of these possibilities, which would likely make the SSNIP unprofitable (and would explain why Apple is not charging higher commission rates).

83. Finally, the only substitution data Dr. Evans uses in this "test" is, like the participants' responses to Professor Rossi's survey, in response to an event decidedly different from a SSNIP. In this case, the data come from Epic's "hotfix." It is therefore not substitution in response to a quality or price change, and so is not analogous to a SSNIP.

v. Dr. Evans' two-sided "tests" for his alleged "smartphone operating systems" and "iOS App Distribution" markets

84. In addition to these one-sided "tests," Dr. Evans offers two two-sided "tests," one for his alleged foremarket for "smartphone operating systems" and another for his alleged aftermarket for "iOS App Distribution." These "tests" are purportedly meant to account for indirect network effects, i.e., for the two-sided nature of each alleged market.

85. In reality, neither properly does so. In both "tests," Dr. Evans essentially argues (using no formal analysis) that, because the separate effects of price changes on each side are small based on his "tests" addressed above (subject to the numerous errors already discussed), there can be no meaningful indirect network effects.

86. This argument misrepresents the feedback loops that indirect network effects create, in which even small perturbations on one side of the market can, in the longer run, propagate into large changes in the overall popularity of the platform. Dr. Evans acknowledges in his direct testimony that "special issues arise" with two-sided platforms,[15] but does not specify or address these issues. The literature, including the writings of Dr. Evans, is clear that feedback loops can be meaningful and must be taken into account, but Dr. Evans does not do so here.

87. This dynamic is highlighted in the extract from one of Dr. Evans' writings, below ("Platform Economics: Essays on Multi-Sided Businesses," *Competition Policy International*, 2011, p. 24):

> **1.** The link between the customers on the two-sides affects the price elasticity of demand and thus the extent to which a price increase on either side is profitable. It therefore necessarily limits market power all else equal. Consider two sides ***A*** and ***B.*** An increase in the price to side ***A*** reduces the number of customers on side ***A*** and therefore reduces the value that customers on side ***B*** receive from the platform. That in turn reduces the price that side ***B*** will pay and the number of customers on side ***B.*** The reduction in the number of customers on side ***B*** in turn reduces the demand on side ***A*** and thus the price that customers on side ***A*** will pay. These positive feedback effects may take some time to work themselves out, but, as we demonstrated above, even if, say, customers on side ***A*** are not very sensitive to price, all else (including the behavior of those in side **B**) equal, demand from side ***A*** may nonetheless end up being very price-sensitive indeed when these feedback effects work themselves out.

88. Therefore, the problems with Dr. Evans' "tests" of his "iOS App Distribution" market are not mere technical flaws, but rather lead to incorrect conclusions and should be disregarded.

E. Conclusion on product market definition

89. Given that the App Store is a two-sided transactions platform, and in light of the substantial evidence of substitution in transactions across different digital game transaction platforms, I conclude that the relevant antitrust product market in this matter is the market for digital game transactions. Clustering game transactions together with transactions for other apps would be inappropriate, since the relevant competitive conditions differ. Moreover, none of Epic's experts has offered the analysis necessary for clustering all iOS app transactions together in the same antitrust market. Excluding other game transaction platforms and focusing on an aftermarket for "iOS app distribution" would also be inappropriate, as the facts of this case are inconsistent with the foremarket/aftermarket framework. Finally, Dr. Evans' purported hypothetical monopolist tests are completely without probative value and should be dismissed because they fail to meaningfully engage with the essence of market definition—customers' substitution patterns—among myriad other flaws.

[15] Evans written testimony, ¶ 36.

IV. The relevant antitrust geographic market is the United States

90. The general principles underlying the definition of relevant antitrust product and geographic markets are the same. The geographic market inquiry thus centers around the willingness and ability of customers on both sides of a two-sided platform—in the present context, game developers and consumers who play games—to substitute between products that are offered in different geographies.

91. Game developers generally face few geographic constraints, because they can transact with consumers in another country by publishing on platforms within that country. No matter their country of origin, however, developers must compete for U.S. consumers on platforms' U.S. storefronts. Geographic constraints are more important for consumers. Due to regulatory and other restrictions (censorship, ratings, taxes, etc.), game transaction platforms typically operate in country-specific storefronts that offer different apps and features, and consumers have limited capabilities to switch to a storefront other than the storefront of their home country. On the App Store, for example, consumers are allowed to change country or region through the software on their phones, but the process involves a number of steps and conditions that most consumers would find too inconvenient unless strictly necessary (such as spending all App Store credit, cancelling subscriptions, and get a new payment method and address for the new country or region). While certain consumers do get around such restrictions, this requires that they technically violate terms of service, provide incorrect registration information, or register without a credit card and forgo the ability to download any paid apps or engage in in-app purchases. The typical consumer, therefore, is generally restricted to purchases from platforms that operate in their own country.

92. Furthermore, I understand from my time at the FTC that U.S. antitrust laws are concerned with U.S. consumer welfare. Ultimately, this leads me to conclude that the relevant geographic market is the U.S.

93. Finally, Dr. Evans' "global except for China" geographic market is an inappropriate application of cluster markets because competitive conditions differ across countries (e.g., Dr. Evans shows differences in income and market outcomes) and so it would be inappropriate to cluster all countries into a single market as Dr. Evans does.

V. The evidence is inconsistent with Apple possessing monopoly power or charging supracompetitive prices

A. Economic principles relevant to market power analysis imply that output best captures the relevant net effects

94. The economic literature defines "market power" as "the ability of firms to raise price above the competitive level for a sustained period," i.e., the ability to profitably charge supracompetitive prices.[16] Market power may affect terms of trade besides price, such as quality, and so is best thought of as reflecting the ability of firms to charge supracompetitive quality-adjusted prices. The term "monopoly power" can be used to indicate a high degree of market power.

95. Economists generally evaluate the presence or absence of market power through evidence on "market structure" (including market shares) and "market outcomes" (e.g., price, output and quality). Evidence on market structure can help establish that an unconcentrated market with many small competitors is likely to be competitive, but the inverse is not always true—a concentrated market does not always imply the existence of market power. The economics literature considers market outcomes to generally be better suited than market structure to evaluating claims regarding market power.[17]

96. As price increases and output restrictions are two sides of the same coin, market power can also be thought of as the ability to profitably restrict output. Output, properly measured and benchmarked, can be a particularly useful market outcome to analyze in evaluating the existence or extent of market power. Dr. Evans agrees that output is a "headline" metric.

97. Output is an especially important metric for evaluating the presence or absence of market power because it can be more easily interpreted relative to other measures. For example, if the net effect of any price and quality changes is that the product is better for consumers, they will purchase more of it and output will rise, indicating a net benefit to consumers overall.

98. Output measurement is not simple, but other market outcomes often are even more difficult to measure appropriately. For example, most measures of profits are accounting measures, which are not the same as economic profits. Price may also be measured in different ways, and determining which measure of price is most informative or whether multiple measures must be jointly considered can be critical to drawing appropriate conclusions. Further, consumers care about quality-adjusted price, not just about absolute price. Measurement issues aside, in any case, profitability and price are only two considerations among many and often must be considered alongside other factors, such as output. If a firm increases the quality of its product, for example, a corresponding increase in price is not necessarily anticompetitive.

99. Finally, as the App Store is a two-sided transaction platform, Professor Schmalensee explains that market power analysis must account for the fact that, even if market power existed on one

[16] Jonathan B. Baker and Timothy F. Bresnahan, "Economic Evidence in Antitrust: Defining Markets and Measuring Market Power," in Handbook of Antitrust Economics, ed. Paolo Buccirossi, (Cambridge, MA:MIT Press, 2008) ("Baker and Bresnahan"), p. 15.
[17] Baker and Bresnahan, p. 15.

side of a platform (here, either consumers or developers), the platform nonetheless may be constrained from setting a supracompetitive price on that side due to the effects that feedback loops might have on both sides of the platform.

B. Evidence on output and other outcomes is inconsistent with Apple possessing monopoly power or charging supracompetitive prices

100. Output being the most informative measure in evaluating market power, it is critical to note that all output measures relevant to Epic's claims have increased substantially over time. Professor Hitt explains that App Store output measured by third-party game developer revenue increased by 2,600% from 2010 to 2018. As benchmarks, consider that game developer revenue across the relevant market increased by only 448% during the same time period, and game developer revenue on Google Play increased [redacted] from 2013 to 2018. That the App Store growth rate is much higher than these benchmarks is evidence not only that Apple does not restrict output on the App Store, but rather that it offers a *lower* quality-adjusted price than many of its competitors and so has contributed to the expansion of market output to a greater degree than many of its competitors.

101. Before moving to other evidence, I note that while Dr. Evans argues that Apple's smartphones are more appealing to consumers who are more likely to use and spend on smartphone apps,[18] and that the digital economy is "vast, growing, and heavily reliant on smartphones and apps,"[19] he ignores Apple's role in driving this growth and the statistics I just discussed. He instead asserts, with no analysis, that Apple has diminished output in "iOS app distribution," even though he acknowledges that he has not studied output growth nor whether it declined when, according to him, Apple obtained monopoly power.

102. Focusing on commission rates, as Dr. Evans has done, the App Store's commission rate for game transactions is competitive with pricing on other game transaction platforms. Professor Hitt explains that almost all digital game transaction platforms charge commissions of 30% or more. Apple has never increased its commission since it opened the App Store in 2008; instead, Apple's effective commission has fallen as a result of a sizeable increase in zero-commission transactions and other commission rate decreases over time.

103. Evidence on market structure also clearly indicates that Apple lacks monopoly power. Professor Hitt explains that the market includes multiple sizeable competitors and that Apple's share of the relevant market of game transactions is at most 37.5% and as low as 23.3% when accounting for competition from one-sided alternatives, as Dr. Evans suggests one should.

104. Evidence on entry is also inconsistent with Apple having monopoly power in the relevant market. Professor Hitt documents the entry and expansion of numerous competitors, including participants in adjacent markets that impose competitive constraints, such as game streaming services.

[18] Evans written testimony, ¶ 81.
[19] Evans written testimony, ¶ 7.

C. Dr. Evans' five "indicators" fail to establish that Apple has monopoly power or is charging supracompetitive prices on the App Store

105. Dr. Evans relies on five indicators related to market outcomes and market structure to purportedly demonstrate Apple's monopoly power. He claims that Apple is a monopolist with a virtually 100% share, high profit margins, high commission rates and low investments in quality, that its dealings with developers are evidence of market power, and that there are barriers to entry. I discuss these indicators below, none of which establishes Apple's monopoly power.

106. First, Dr. Evans' allegation that Apple has a market share of virtually 100% rests entirely on his incorrect market definition. As Professor Hitt explains, and as I explained above, Apple has a much lower share of a properly defined relevant market of digital game transactions. Moreover, the fact that game developers and consumers multi-home creates opportunities for substitution, especially substitution of *transactions*, which constrain Apple's market power on iOS. In other words, if consumers were given incentives to substitute (e.g., via developers setting higher prices for iOS transactions), they could choose to make purchases on any platform they have access to even if they mostly play on another platform. Even consumers who do not have access to a non-iOS device have the option of entering into transactions that are not subject to Apple's commissions through the Safari browser (e.g., to buy V-Bucks).

107. Second, Dr. Evans is also wrong to argue that Apple earns an unusually high profit margin on the App Store as further evidence for monopoly power. There are both methodological and conceptual problems with this claim. Economists recognize that in differentiated products industries such as the classic example of entertainment products, or the industry at issue here, price premiums well above marginal costs are to be expected and are not, on their own, evidence of supracompetitive pricing. This is even more so for firms in highly dynamic industries, where sustained investments are needed to remain competitive. Economists also generally do not consider accounting profits to be an accurate measure of economic profits, especially for firms like Apple that invest substantially in intellectual property. Note that Epic is a good example of another differentiated product firm that enjoys high accounting margins. Moreover, as Professor Schmalensee explains, Dr. Evans relies on App Store margins information that is inappropriate. Apple does not use (or generate) information on fully-burdened margins for the App Store, or other parts of its ecosystem, in the ordinary course of business. Apple does not view these as discrete lines of business, but instead as interconnected parts of its ecosystem, all of which work together to provide a high-quality consumer experience.

108. Third, contrary to Dr. Evans' claims, Apple does not charge a supracompetitive commission rate on the App Store. As I have explained, numerous comparable game transaction platforms charge commission rates that are identical to those charged on the App Store, including several platforms that, like Apple, operate "walled gardens" that do not permit third party stores or direct distribution by developers to consumers. His claim is also inconsistent with his market definition claim that Apple is charging *less* than the profit-maximizing commission rate—that, as an alleged monopolist, it could have increased its profits by nearly a billion dollars in FY 2019. Finally, Apple set its commission rate of 30% at a time when it had a very small user base—and a time when even Dr. Evans agrees Apple had no monopoly power. As Professor Hitt explains, the average commission rate charged by the App Store also has decreased over time, and is now

less than two cents per download. Including app updates, all of which are free, the average commission across initial downloads and updates is substantially lower—virtually zero.

109. Fourth, Dr. Evans is wrong to claim that Apple's interactions with developers are evidence of monopoly power. Dr. Evans claims that large developers not being able to negotiate better terms on the App Store is evidence of Apple's monopoly power. Like the previous one, this argument ignores that, as acknowledged by Dr. Evans, Apple set its commission rate of 30% and its policy against sideloading in 2008—a time when it had a very small user base and hence no monopoly power. It also similarly ignores that Apple has reduced its commission rate over time. For example, the introduction of the "reader" rule for certain types of apps (2011), the 15 percent commission on subscription renewals after the first year (2016), and the 15 percent commission charged to developers that gross less than one million dollars (2021). Most importantly, treating large and small customers differently in certain ways and not in others is consistent with Apple acting to maximize the value of the App Store platform. Providing better terms to large developers might hurt Apple's goal of having variety in its app offerings for consumers. This variety enhances indirect network effects and hence the quality of transactions to consumers and, indirectly, to developers.

110. Finally, what Dr. Evans claims are barriers to entry to the App Store are, instead, part of Apple's business model, which is not anticompetitive. Dr. Evans claims that Apple's alleged monopoly power is protected by the terms that prevent certain app transactions on iOS other than through the App Store. These terms, however, do not constitute anticompetitive conduct—they are part of Apple's "walled garden" business model, which is shared by several other platforms and is not by itself evidence of anticompetitive behavior. Moreover, as already mentioned, Apple set these terms in place at the time the App Store was created, when Dr. Evans agrees it had no monopoly power. Dr. Evans' argument regarding market structure and barriers to entry in his "iOS App Distribution" market amounts to saying that "walled garden" business models always entail monopoly power. Specifically, Dr. Evans' logic implies that all consoles (Sony PlayStation, Microsoft Xbox, and Nintendo Switch) are monopolists with 100% share of a relevant antitrust market for distribution of apps on their platforms, with barriers to entry created via contract. Lastly, his classification ignores the value that walled-garden platforms provide to developers (including platform investment in tools and other innovations) and consumers (including privacy, security, compatibility, and quality benefits). Platforms invest in generating such value in order to compete with other platforms in both hardware sales and game transactions.

D. Dr. Evans fails to establish that market outcomes would be improved in his but-for world

111. Dr. Evans offers two approaches to describe the but-for world (the world without the challenged conduct), both of which fail to establish that market outcomes would be improved. Professor Hitt addresses the first approach, which relies on China as a but-for world. Professor Hitt explains both why China is a flawed competitive benchmark and, most importantly, that it actually suggests a but-for world that would be *worse* for game developers and consumers who play games.

112. Dr. Evans' second approach is an "analysis" suggesting that, absent Apple's alleged conduct, other app stores could enter and compete profitably for the distribution of apps on iOS, which he claims would lead to lower prices and higher quality. This "analysis" suffers from fatal methodological and conceptual flaws, and should be disregarded.

113. What Dr. Evans has produced in reality is an algebraic exercise, not an economic analysis. Instead of modeling the economic behavior of firms, Dr. Evans looks for the commission rate that makes a certain equation true. However, that equation is derived not from standard economic principles, industry data, or optimal firm behavior, but rather from a long list of arbitrary assumptions that Dr. Evans has not properly supported and that are not based on economic logic.

114. Given Dr. Evans' flawed and non-standard approach, it is not surprising that it leads to results that do not comport with intuition, standard economic results, or reality. For example, Dr. Evans' "analysis" predicts that Apple and the entrants would make higher profit margins by increasing their commission rates above his "prediction." Holding everything else about Dr. Evans' analysis the same, they would make margins of 88.3% instead of 45.8% if they raised commission rates to 90%. As another example, if he were to assume that there were five entrants instead of two, his exercise predicts that entry would cause commission rates to *increase* rather than decrease, from 26.4% before entry to 28.9% after entry. If he were to assume ten entrants, he would predict that commission rates would increase to 66.3%. These results go against his claims—that entry would lower prices and benefit consumers—and underscore how his assumptions and calculations produce nonsensical results.

115. The reason for these nonsensical results is that Dr. Evans' algebraic exercise depends on many assumptions, including one about fixed costs. Intuitively, Dr. Evans' equation yields higher commissions when fixed costs for the entrants are higher, or when they are spread across fewer customers due to a larger Apple share or a greater number of entrants. This relationship implied by Dr. Evans' approach contradicts standard economic principles about the relationship between prices and costs: price should depend only on marginal costs (often proxied by variable costs); fixed costs should have no direct effect on price (although they do in Dr. Evans' approach). Instead, fixed costs in economic models affect whether, or how many, firms choose to enter the market (although they do not in Dr. Evans' approach, because the number of entrants and the shares they each garner are assumed, not generated by a model based on optimal firm behavior as they should be).

E. Conclusion on market power

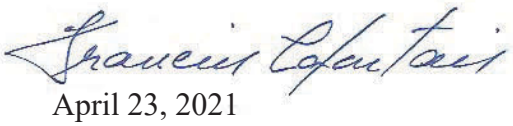
116. The evidence demonstrates that Apple is constrained from charging supracompetitive quality-adjusted prices in the App Store. Apple's alleged conduct in the App Store therefore cannot have harmed competition in the relevant market for game transactions, nor generated antitrust injury to Epic. Apple introduced the App Store as a two-sided transaction platform in 2008, with a business model that has met with much success. The "walled garden" was an intentional, publicized feature of the iPhone and its ecosystem from the start, promising safety to users. The commission rate that Apple charges was introduced at a time when Apple had a much smaller market share, a time when Dr. Evans acknowledges Apple had no monopoly power. The commission rate has remained the same or fallen since then, and is still competitive relative to other platforms. All the while, Apple has continued to add features, increase the quality of its

products and platform services, and it has grown its output at a pace much higher than the broader market. Collectively, these facts lead me to conclude that while Apple has found much success with the App Store, this outcome is the fruit of competition on the merits.

VI. Oath

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct.

Respectfully submitted,



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